



Managing Pastures - Readers' Note

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Efficient supplementation of cows on pasture

This section discusses the factors that determine response to supplementation.

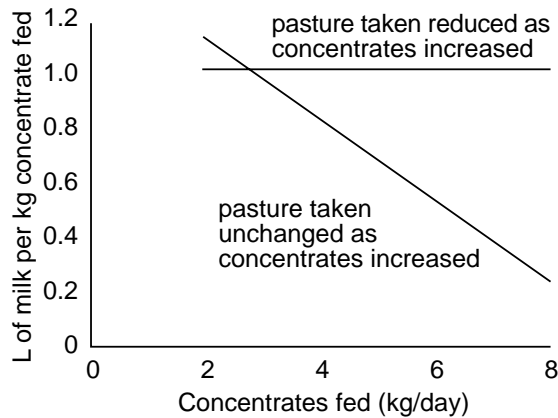
Concentrates can be given:

- to fill seasonal feed gaps
- to allow pasture growth and utilisation to be optimised
- to ensure that cows are on a rising plane of nutrition at mating.

The concentrate should be balanced for nutrients that limit production.

Concentrates are expensive, and when they are fed to cows also grazing pasture, the response is lower than under feedlot

Figure 21. If pasture availability is reduced as concentrates are increased, response to feeding should not change. On the other hand, if concentrates are increased but pasture availability stays the same and is high, response to concentrate fed decreases markedly⁽⁵⁾.



conditions. This is because cows invariably reduce their pasture intake as they are less hungry. This is called the **substitution effect**. Therefore, concentrates should be fed under conditions that minimise substitution.

The **potential** response to 1kg of concentrate is predictable—1kg of, say, barley contains 90% DM and has an ME value of about 13MJ/kg DM. To produce milk with 4.7MJ/L energy (at 3.6% milk fat), 1kg of barley should produce $13 \times 0.9 \div 4.7 = 2.5$ L milk (if all other nutrients are adequate).

The **actual** response to an additional 1kg of concentrates varies from nil to 1.5L of milk, depending on the rate of substitution (of grass for concentrates) and on the effect of feeding concentrates on digestion of pasture in the rumen. In practice, very low responses can be expected from medium- to low-genetic-merit cows, in late lactation, on lush pasture, fed high amounts of concentrate. High responses can be expected from high-genetic-merit cows, in peak lactation, on poor quality pasture, and to the first few kg of concentrate a day.

Table 6 and Figure 21 show the effect of both genetic merit and level of concentrate feeding on production response.

Table 6. The amount of milk produced per kg of concentrate fed decreases as more concentrate is given. High-genetic-merit cows do better than low-genetic-merit cows. The response in each case is relative to that of a group fed no concentrate.

Genetic merit	kg concentrate fed per cow per day	L of milk produced per kg DM fed	Total L produced on concentrate
Medium	2.9	1.24	3.6
	6.3	0.68	4.3
High	2.9	1.46	4.2
	6.3	0.97	6.1

On average, dairy farmers cannot expect more than 1L of milk per kg DM of concentrate fed. With the cost of 1kg of concentrate near that of 1L of manufacturing milk, concentrates must be fed cautiously. Feeding concentrates merely to increase production per cow, and constant feeding throughout the year, can only be wasteful as it must be associated with a high level of substitution for at least part of the year.

To gain a far greater benefit from

feeding concentrates to cows on pasture, feed concentrates in order to achieve increased stocking rates and thereby to achieve greater utilisation when pastures are in surplus (Figure 22). In this situation, the direct benefits of feeding concentrates are minor but there is an overall increase in farm productivity. Thus the direct effect on milk response is not the dollar value of feeding concentrates but the dollars gained from higher stocking rate.

Figure 22. Surplus and deficit before and after supplementation when this is associated with an increase in stocking rate to soak up the greater pasture surplus.

